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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WEST, JEFFREY R

ART UNIT PAPER NUMBER

2857

DATE MAILED: 07/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/839,097

Applicant(s)

VERMA ET AL.

Examiner

Jeffrey R. West

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 28, line 2, of the substitute specification, "strategy is results" should be -
--strategy results---.

Appropriate correction is required.

Claim Objections

2. Claims 14-27, 29, 30, and 32 are objected to because of the following informalities:

In claim 14, line 3, to avoid problems with antecedent basis, "associating data classifiers" should be ---associating a plurality of data classifiers---. A similar change should be made to claims 20 and 26.

In claim 14, line 5, to avoid problems with antecedent basis, "said sample" should be ---said data sample---. A similar change should be made to claims 20 and 26.

In claim 14, line 6, to avoid problems with antecedent basis and avoid confusion, "a plurality of classifiers" should be ---said plurality of data classifiers---. A similar change should be made to claims 20 and 26.

In claim 14, line 8, to avoid problems with antecedent basis, "the sample" should be ---the data sample---. A similar change should be made to claims 20 and 26.

In claim 14, line 10, to avoid problems with antecedent basis, "said sample" should be ---said data sample---. A similar change should be made to claims 20 and 26.

In claim 15, line 1, to avoid problems with antecedent basis, "a classifier" should be ---said each of a plurality of data classifiers---. A similar change should be made to claim 21.

In claims 16, 18, 27 and 29, to avoid problems with antecedent basis, "classifiers" and "said classifiers" should be ---said plurality of data classifiers---. A similar change should be made to claims 22, 24, 30, and 32.

In claims 15-19 and 29, to avoid problems with antecedent basis, all the occurrences of "sample" should be ---data sample---. A similar change should be made to claims 21-25 and 32.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 14-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled

in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 14 includes limitations for "assigning accuracy confidence values for each classifier in said decision fusion application based on said greatest value; and improving a classification accuracy of said decision fusion application based on said accuracy confidence values." These limitations, however, are not sufficiently described in the specification to enable one having ordinary skill in the art to use the invention.

The specification, firstly, does not define any "accuracy confidence values", but instead includes sample confidence values L_{ij} and overall confidence values H_i . Further, the specification does not include support for assigning accuracy confidence values based on a greatest value. The overall method of the invention is described on page 30, lines 6-20, of the substitute specification. This passage describes "[f]or every incoming sample j , sample confidence values L_{ij} ($1 \leq i \leq IICII$) are computed for every classifier i . The overall confidence H_i for the classes C are updated using L_{ij} . Preferably, a weight w_{ij} is assigned to each classifier i as a function of the overall confidence H_i and the sample confidence L_{ij} . Once weights w_{ij} for each classifier are known, each incoming sample j can be classified in a class k by calculating the combined log-likelihood CL_{jk} for each class k , as set out directly below.

$$CL_{jk} = \sum_{i=1}^c w_{ij} * 1_{ijk}$$

where $w_{ij} = f(L_{ij}, H_i)$. For the sample j , the class k with the highest calculated combined log-likelihood CL_{jk} is finally chosen as the correct class k for sample j .”

As seen in this passage, the confidence values L_{ij} and H_i , assumed to be the accuracy confidence values as claimed, are not assigned to each classifier based upon any greatest value. Instead, the confidence values are used in the calculation of w_{ij} , for use in the calculation of a combined log-likelihood CL_{jk} , which is then chosen as the correct class based when it is the highest of a plurality of combined log-likelihood values. This does not sufficiently support a limitation for “assigning accuracy confidence values for each classifier in said decision fusion application based on said greatest value” and therefore one having ordinary skill in the art would not be enabled to use the invention as claimed.

Other sections of the specification that describe the overall operation of the invention include page 28, lines 5-24 and page 31, lines 10-18, of the substitute specification.

Page 28, for example, describes “[a] weight or metric of relative confidence is computed for every classifier by determining its sample confidence and overall confidence (as subsequently described). For each class, an overall score (or likelihood) is calculated which combines individual scores from all classifiers, which allows the class with the highest score (or likelihood) to be designated as the correct

class.” This section also indicates that the confidence values are assigned for each classifier and are subsequently used for determining which weighted summation is greatest in value. Therefore, this section cannot support a limitation for using the weighted summation to determine a greatest value and using the greatest value to assign the confidence values.

Similarly, page 31 describes, “[i]nitially, in step 10, the process involves calculating a metric of relative confidence values for respective classifiers or class models which predict how a sample should be recognized. L_{ij} is calculated in step 20 as an L-statistic of the log-likelihoods l_{ijk} , as detailed below. The moving average H_i , across a suitable number of samples j is then determined in step 30. This allows weights W_{ij} to be calculated in step 40 for each classifier using H_i and L_{ij} , according to a suitable function as detailed below. The combined likelihoods across classifiers CL_{jk} are then calculated in step 50 as a weighted summation of the likelihoods of each class, so that the most likely class can then be determined in step 60.”

It can again be seen that the confidence values are assigned to classifiers in order to determine a weighted summation. This does not enable one having ordinary skill in the art to use a weighted summation to determine a greatest value and then using the greatest value to assign the confidence values.

Claim 20 and 26 are also rejected under 35 U.S.C. 112, first paragraph, because they recite similar limitations.

Claims 15-19, 21-25, and 27-32 are rejected under 35 U.S.C. 112, first paragraph, because they incorporate the lack of enablement present in their respective parent claims.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14-32 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 includes a limitation for assigning accuracy confidence values based on "said greatest value", while there is no previous mention of any "greatest value". The claim does present a limitation for "designating said [data] sample as belonging to said particular class for which said weighted summation is greatest in value" but this limitation does not provide any "greatest value", but instead determines which weighted summation is greatest in value relative to a plurality of other weighted summations. This limitation is a comparison that does not arrive in a specific value. Since there is no "greatest value" presented, it is unclear to one having ordinary skill in the art to what "said greatest value" refers as well as how to assign accuracy confidence values based on "said greatest value".

Claims 20 and 26 are also rejected under 35 U.S.C. 112, second paragraph, because they recite similar limitations.

Claims 29 and 32 are also rejected under 35 U.S.C. 112, second paragraph, because they recite "said sample confidence component" without any previous mention of any "sample confidence component". Therefore, it is unclear to one having ordinary skill in the art to what "said sample confidence component" refers as well as how to determine a relative confidence level based on such a value.

Claims 15-19, 21-25, 27, 28, 30, and 31 are rejected under 35 U.S.C. 112, second paragraph, because they incorporate the lack of clarity present in their respective parent claims.

Response to Arguments

7. Applicant's arguments with respect to claims 14-32 have been considered but are moot in view of the new ground(s) of rejection.

The following arguments, however, are noted.

Applicant argues that "[i]n view of the amended claims, neither Jiang nor Liu teaches" the invention as claimed. Applicant also argues that "[i]n the present application, the reason given to support the proposed combination is improper, and is not sufficient to selectively and gratuitously substitute parts of one reference for a part of another reference in order to try to meet, but failing nonetheless, the Applicant's novel claimed invention. Furthermore, the claimed invention, as amended, meets the above-cited tests for obviousness by including embodiments such as assigning accuracy confidence values for each classifier in a decision fusion

application based on the greatest value attributed to a weighed summation across a plurality of classifiers of a data sample”.

The Examiner asserts, that as noted in the rejection above, the amendments to the claims are not sufficiently supported by the specification to meet the enablement requirement, and therefore the arguments are considered moot.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 6,539,353 to Jiang et al. discloses a method for performing confidence measures using sub-word-dependent weighting of sub-word confidence scores for robust speech recognition comprising computing a weight (i.e. a and/or b) for each of a plurality of classifiers (i.e. $f_{\text{class}}(U_i)$) (column 6, lines 10-17), wherein the classifiers indicate a manner of classifying a sample in one of a number of predetermined classes (column 6, lines 4-5), calculating for each of a the predetermined classes a weighted summation/confidence summation (i.e. the summation of $f_{\text{class}}(U_i)(x_i)$) across the classifiers of a likelihood that the speech sample belongs to a particular class, weighted by said weight value, (column 5, line 53 to column 6, line 1), and designating the speech sample as belonging to the class for which the weighted summation confidence measurement indicates (i.e. successfully fitting into one of the predetermined classes) (column 6, lines 18-23 and 38-44).

Jiang discloses that the weight value (i.e. a and/or b) for a classifier, specific to each class with corresponding weights specific to each class and therefore specific to each classifier, comprises a sample confidence component (column 7, lines 1-10) calculated, in the same manner as above (column 7, lines 13-18), as a weighted summation/confidence summation (i.e. the summation of $f_{\text{class}}(U_i)(x_i)$), and a cumulative component comprising a mean, (i.e. $CS(w)$), of the weighted summation/confidence summation across the classifiers, (i.e. $f_{\text{class}}(U_i)$), of the log likelihoods (i.e. x_i) over a plurality of samples (i.e. a 1 to N) (column 5, line 53 to column 6, line 1).

Further, since $CS(w)$ is a cumulative mean of the confidence levels of the speech samples over time, it is considered inherent that the cumulative mean is successively updated with the sample confidence since the cumulative mean summation is the summation of each new confidence level obtained.

Jiang also discloses performing the method using an input means to receive data (column 3, lines 3-12) and a processor means, with associated code stored on a computer readable medium, for executing the processing (column 2, lines 30-35 and 44-56).

U.S. Patent No. 5,880,767 to Liu teaches a perceptual image resolution enhancement system for processing and sharpening various types of images by filtering the input image to extract a plurality of components (column 1, lines 41-56) and classifying the data for adaptive sharpening of the image (column 2, lines 17-28) wherein the filtering is carried out using a nonlinear order static filter (i.e. L-filter) for

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weighting the components as a sum of the defined coefficients multiplied by ascendingly/descendingly ordered data (column 5, lines 10-25). Further the invention of Liu only provides coefficients for the first two terms, and 0 for the rest of the terms, therefore providing a difference between the first and second choices that are most likely.

Potamianos et al., "A cascade visual front end for speaker independent automatic speechreading" teaches a method for audio-visual recognition and classification.

Verma et al., "Late Integration in Audio-Visual Continuous Speech Recognition" teaches speech recognition through weighted classification.

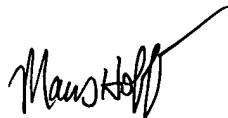
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jrw
July 25, 2004



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